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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/791,902	03/04/2004	Kazuyuki Iwamoto	03500.017942.	4469
5514	7590	11/24/2006	EXAMINER	
FITZPATRICK CELLA HARPER & SCINTO			PHAM, HAI CHI	
30 ROCKEFELLER PLAZA			ART UNIT	
NEW YORK, NY 10112			PAPER NUMBER	
			2861	

DATE MAILED: 11/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/791,902

Applicant(s)

IWAMOTO, KAZUYUKI

Examiner

Hai C. Pham

Art Unit

2861

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 31 August 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 and 18-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 18-33 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |                                                                                                            |                                                                                         |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____                                                |

## DETAILED ACTION

### *Drawings*

1. The drawings were received on 08/31/06. These drawings are accepted.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 18-21, 23-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takase et al. (Pub. No. US 2001/0052927) in view of Kobayashi (JP 2003-195207).

Takase et al. discloses a laser scanning device comprising a first lens barrel portion (the first of the pair of lens barrels 12a, Fig. 3) for holding a first laser element (the first of the pair of laser sources 11) for emitting a first laser light, a second lens barrel portion (the second of the pair of lens barrels 12a) for holding a second laser element (the second of the pair of laser sources 11) for emitting a second laser light so that an optical axis of the second laser light is slanted with respect to an optical axis of the first laser light (the optical axes of the first and second laser light emitted from the laser sources 11 are slanted with respect to each other) (Fig. 1), and a rotary mirror

(single polygon mirror 6) for scanning commonly the first and second lights, which are emitted from a laser unit, and between which a distance becomes small (Fig. 1).

With regard to claims 1 and 26, Takase et al. fails to teach the first diaphragm portion provided in the first lens barrel portion for shaping a shape of the first laser light, the second diaphragm portion provided in the second lens barrel portion for shaping a shape of the second laser light, the first lens supporting portion provided on a side of a tip of the first lens barrel portion with respect to the first diaphragm portion to support a first collimator lens, the second lens supporting portion provided on a side of a tip of the second lens barrel portion with respect to the second diaphragm portion to support a second collimator lens.

Kobayashi et al. discloses in Figs. 1 and 2 a laser light source device comprising a laser holder (2) for holding a semiconductor laser (1) and a collimator lens (3), a diaphragm portion (26) provided in the lens barrel portion for shaping a shape of the first laser light, and a lens supporting portion (protrusions 23) provided at the tip of the cylindrical portion with respect to the diaphragm portion to support the collimator lens (English translation, paragraph [0033]).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide a diaphragm portion and a plurality of projections at the tip of the laser supporting member with respect to the diaphragm portion to the device of Takase et al. as taught by Kobayashi et al. The motivation for doing so would have been to concentrate the light beam on the surface of the collimator

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by adjusting the size and the shape of the laser beam as well as to reliably support the collimator lens.

Takase et al. also fails to teach the lens supporting portion having projections that are projected from the tips of the lens barrel portion, in order to support parts of circumferential surfaces of the collimator lens (claims 18, 27), the collimator lens being bonded to lens supporting portion (claims 19, 28), the plural projections being projected from the tip of the lens barrel portion (claims 20, 29), the plural projections partially supporting the circumferential surfaces of the collimator lenses (claims 21, 30), and the laser element being fixed by press fit to the lens barrel portion (claim 23).

Kobayashi et al. teaches the lens accommodating portion being formed by a plurality of projections (23) defined by the notches (24) at the tip of the cylindrical portion of the holder member (2) to partially support the circumferential surface of the collimator lens C (Figs. 2-3). Kobayashi et al. further teaches the laser holder (2) having press-inserting hole (21) for press fitting the semiconductor laser (English translation, paragraph [0033]).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the device of Takase et al. by providing the plurality of projections at the tip of the laser supporting member to support the collimator lens and the laser element to be press-fitted into the holder as taught by Kobayashi et al. The motivation for doing so would have been to reliably support the collimator lens and the laser element.

With regard to claim 24, Takase et al. further teaches the optical axes of the first and second laser beams emitted from the laser emitter being slanted with respect to each other to bring the first and second laser beams close to each other (Fig. 1).

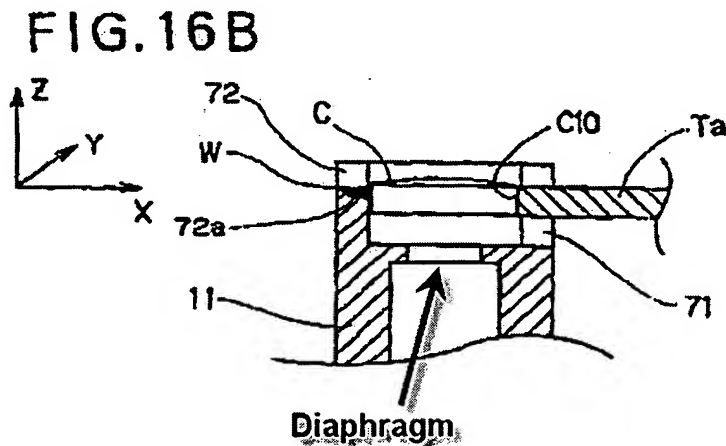
4. Claims 1, 18-21, 23-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takase et al. (Pub. No. US 2001/0052927) in view of Sato et al. (US 6,928,100).

Takase et al. discloses a laser scanning device comprising a first lens barrel portion (the first of the pair of lens barrels 12a, Fig. 3) for holding a first laser element (the first of the pair of laser sources 11) for emitting a first laser light, a second lens barrel portion (the second of the pair of lens barrels 12a) for holding a second laser element (the second of the pair of laser sources 11) for emitting a second laser light so that an optical axis of the second laser light is slanted with respect to an optical axis of the first laser light (the optical axes of the first and second laser light emitted from the laser sources 11 are slanted with respect to each other) (Fig. 1), and a rotary mirror (single polygon mirror 6) for scanning commonly the first and second lights, which are emitted from a laser unit, and between which a distance becomes small (Fig. 1).

With regard to claims 1 and 26, Takase et al. fails to teach the first diaphragm portion provided in the first lens barrel portion for shaping a shape of the first laser light, the second diaphragm portion provided in the second lens barrel portion for shaping a shape of the second laser light, the first lens supporting portion provided on a side of a tip of the first lens barrel portion with respect to the first diaphragm portion to support a

first collimator lens, the second lens supporting portion provided on a side of a tip of the second lens barrel portion with respect to the second diaphragm portion to support a second collimator lens.

Sato et al. discloses a laser emitter comprising a laser holder (10) having a cylindrical portion (11) for holding a semiconductor laser S, a diaphragm portion (see Fig. 16B as reproduced and marked below) provided in the lens barrel portion (cylindrical portion 11) for shaping a shape of the first laser light, and a lens supporting portion (lens accommodating portion or protrusions 70, Fig. 15A-B) provided at the tip of the cylindrical portion with respect to the diaphragm portion to support the collimator lens C.



It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide a diaphragm portion and a plurality of projections at the tip of the laser supporting member with respect to the diaphragm portion to the device of Takase et al. as taught by Sato et al. The motivation for doing so would have been to concentrate the light beam on the surface of the collimator by

adjusting the size and the shape of the laser beam as well as to reliably support the collimator lens as suggested by Sato et al. at col. 6, lines 14-26.

Takase et al. also fails to teach the lens supporting portion having projections that are projected from the tips of the lens barrel portion, in order to support parts of circumferential surfaces of the collimator lens (claims 18, 27), the collimator lens being bonded to lens supporting portion (claims 19, 28), the plural projections being projected from the tip of the lens barrel portion (claims 20, 29), the plural projections partially supporting the circumferential surfaces of the collimator lenses (claims 21, 30), and the laser element being fixed by press fit to the lens barrel portion (claim 23).

Sato et al. teaches the lens accommodating portion (13 or 70) being formed by a plurality of projections (70) defined by the notches (72) at the tip of the cylindrical portion (11) to partially support the circumferential surface of the collimator lens C (Figs. 15A-B) (col. 7, lines 43-65). Sato et al. further teaches the laser holder (10) having press-inserting hole (12) for press fitting the semiconductor laser S (col. 7, lines 51-2).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the device of Takase et al. by providing the plurality of projections at the tip of the laser supporting member to support the collimator lens and the laser element to be press-fitted into the holder as taught by Sato et al. The motivation for doing so would have been to reliably support the collimator lens and the laser element as suggested by Sato et al. at col. 6, lines 14-26.



With regard to claim 24, Takase et al. further teaches the optical axes of the first and second laser beams emitted from the laser emitter being slanted with respect to each other to bring the first and second laser beams close to each other (Fig. 1).

5. Claims 22, 25 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takase et al. in view of Sato et al., as applied to claims 1 and 26 above, and further in view of Nakajima et al. (US 6,621,512).

Takase et al., as modified by Sato et al., further suggests that more than two laser source units can be used to form color images (Takase et al., paragraph [0035]), but does not explicitly teach the full lens support assembly and that the laser elements are fixed to the common electric substrate.

Nakajima et al. discloses in Fig. 26 a multi-beam scanning apparatus comprising a first lens barrel portion (first laser diode mounting portion of the supporting member 339) for holding a first laser element (laser diode 321a), a second lens barrel portion (second laser diode mounting portion of the supporting member 339), of which an optical axis is slanted with respect to an optical axis of the first lens barrel portion (the optical axes of the laser diodes 321a and 321b as defined by the respective mounting portions are at an intersecting angle  $\Phi$ ), for holding a second laser element (laser diode 321b), the first and second laser diode mounting portions forming an integral part of the supporting member (339), a first coupling or collimator lens (323a) being attached to one surface of the projection extending from the forward face of the laser diode supporting member (339), and a second coupling or collimator lens (323b) being

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attached to the other surface of the projection extending from the forward face of the laser diode supporting member (339). Nakajima et al. further teaches a second pair laser-lens assembly being provided, wherein the four laser elements are fixed to the same electric substrate (circuit board 400) (Fig. 29A).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide the device of Takase et al. with a second pair of laser-lens holding assembly with the laser elements being fixed to the same circuit board as taught by Nakajima et al. The motivation for doing so would have been to form a compact print head for recording color image.

6. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takase et al. in view of Sato et al., as applied to claim 26 above, and further in view of Cervantes (US 6,867,794).

Takase et al., as modified by Sato et al., discloses all the basic limitations of the claimed invention except for the detecting means for detecting a laser light emitted from any one of the first and second laser elements, and wherein emission timings of the first and second laser elements are adjusted on the basis of a detection result of the detecting means.

Cervantes discloses a dual-beam laser imaging device wherein the first laser beam is selected to be supplied to the beam detector, which outputs a beam detection signal based on which the recording start timing of the second laser source is

determined such that the scan lines are all aligned in the sub-scanning direction (col. 6, lines 40-55).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to select one of the laser beams in the device of Takase et al. as a reference beam to be detected and to control the write timing of the remaining laser beams based on the detection of the reference beam as taught by Cervantes. The motivation for doing so would have been to dynamically adjust the starting points of the scan lines during imaging.

7. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takase et al. in view of Sato et al., as applied to claim 26 above, and further in view of Yokoyama et al. (Pub. No. US 2002/0036683).

Takase et al., as modified by Sato et al., discloses all the basic limitations of the claimed invention except for the first and second image bearing members exposed by the respective first and second laser elements.

Yokoyama et al. discloses a tandem color image forming apparatus to be well known in the art being provided with a separate photosensitive drum to be exposed by a respective laser light source to form a full color image, the laser element and the corresponding collimator lens being integrally fixed into a respective holder (Figs. 3 and 5).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide a dedicate photosensitive drum to be exposed

by the corresponding laser element in the device of Takase et al. as taught by Yokoyama et al. since Yokoyama et al. teaches this to be well known in the art to provide four image carriers to perform a full color image exposure in a multi-beam electrophotographic apparatus.

### ***Response to Arguments***

8. Applicant's arguments with respect to claims 1 and 18-33 have been considered but are moot in view of the new grounds of rejection.

### ***Conclusion***

9. Applicant's amendment, which changed the scope of the base claims, necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai C. Pham whose telephone number is (571) 272-2260. The examiner can normally be reached on M-F 8:30AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen D. Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



HAI PHAM  
PRIMARY EXAMINER  
November 16, 2006



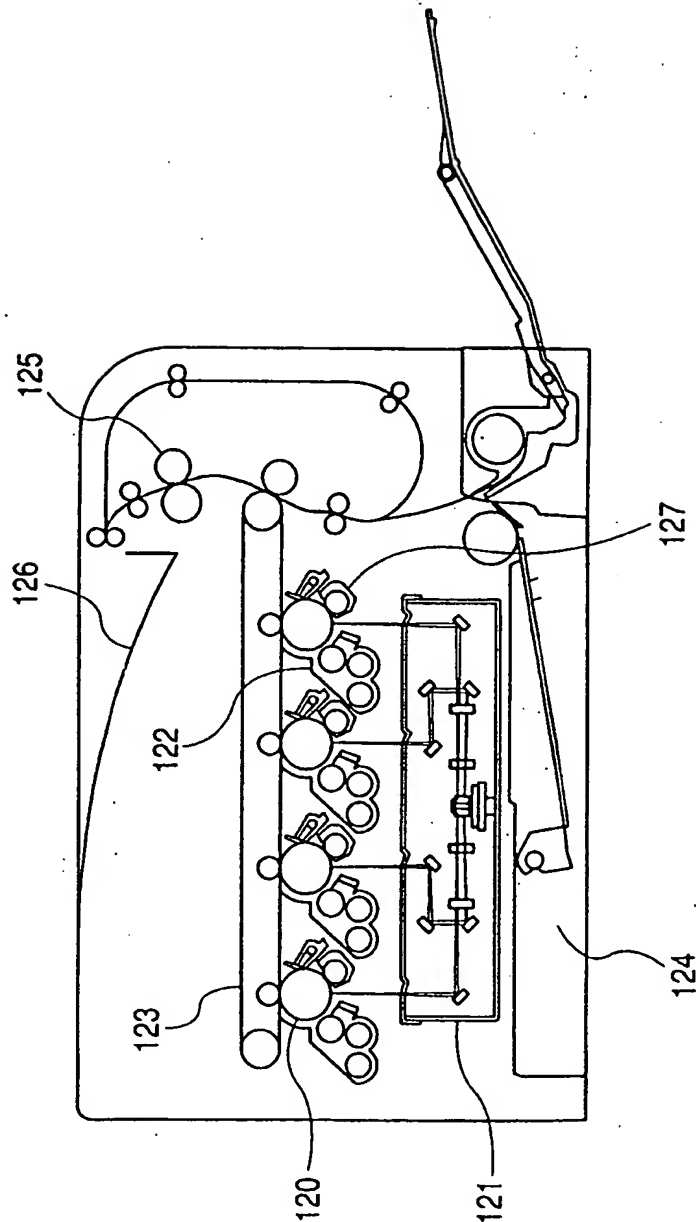
Replacement Sheet

U.S. Patent Application No.: 10/791,902  
INVENTOR: KAZUYUKI IWAMOTO  
TITLE: Laser Emitter and Laser Scanning Device

FIG. 9 (Replacement Sheet)  
Docket No.: 03500.017942.

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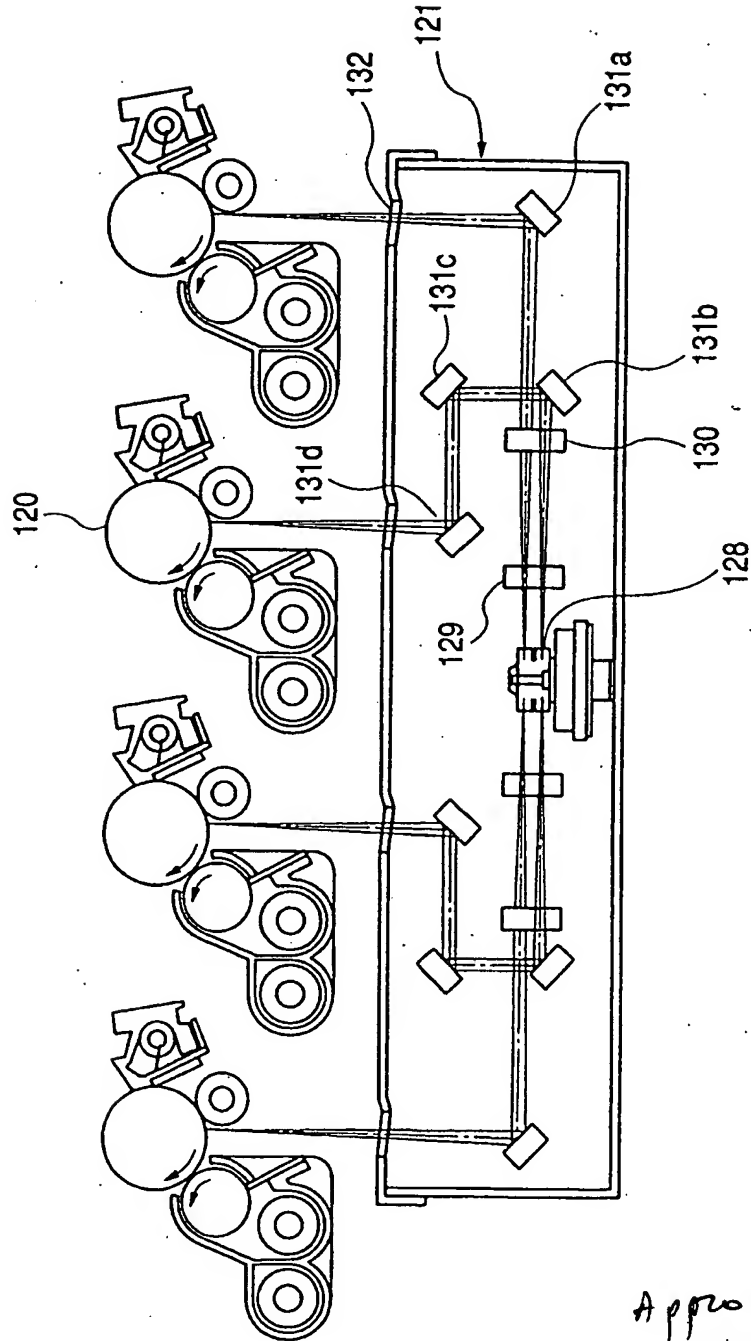
PRIOR ART  
**FIG. 9**



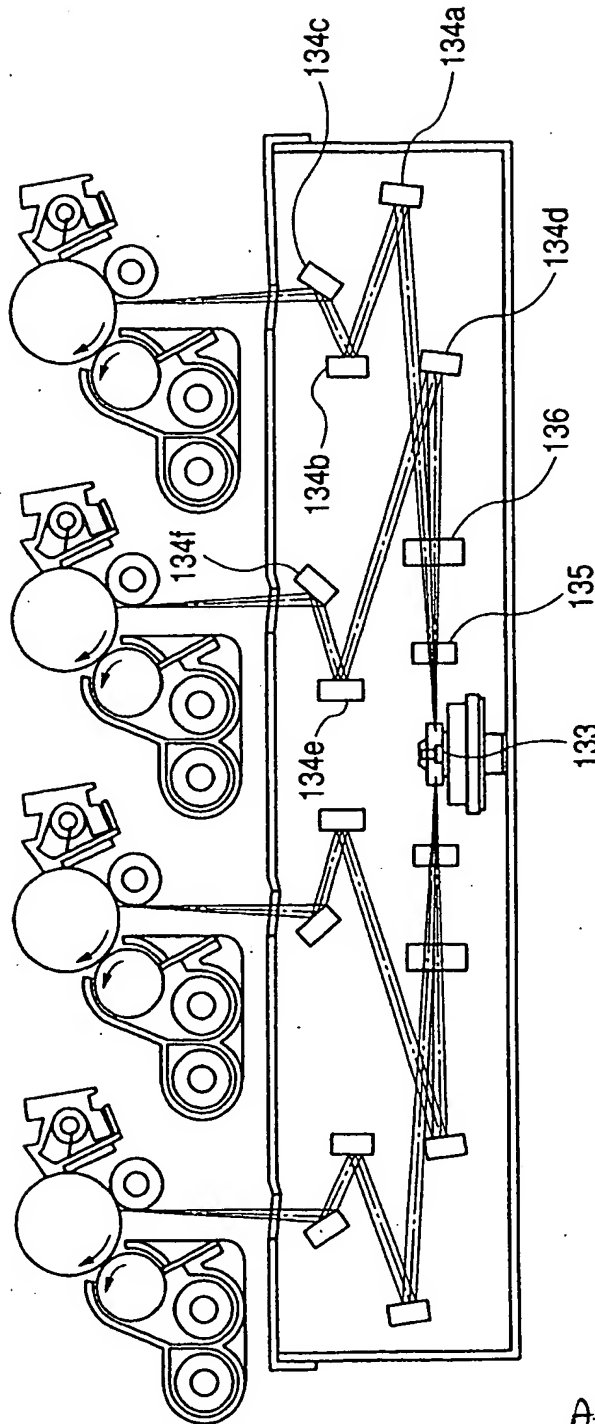
Approved  
HGP  
11/16/06

7 / 10

PRIOR ART  
 FIG. 10



Approved  
 HEB  
 11/16/06



## PRIOR ART

**FIG. 11**

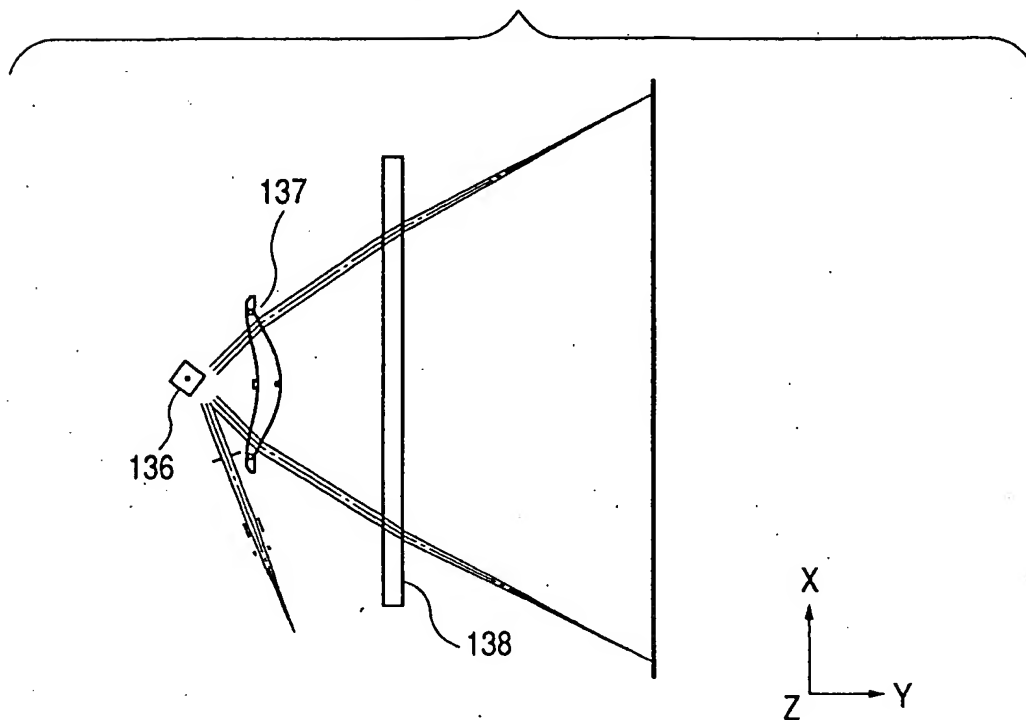
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HCL  
11/16/06



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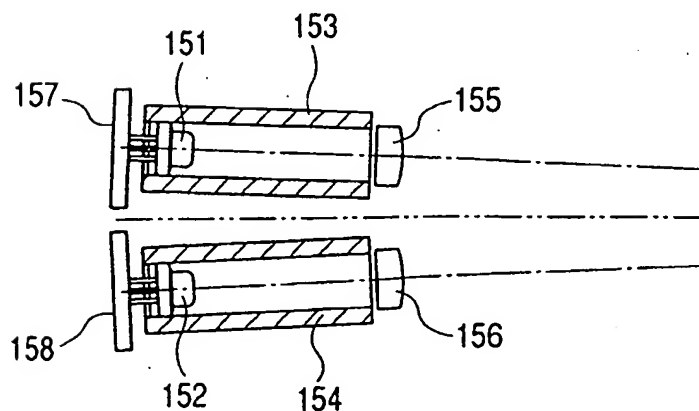
PRIOR ART

**FIG. 12**



PRIOR ART

**FIG. 13**

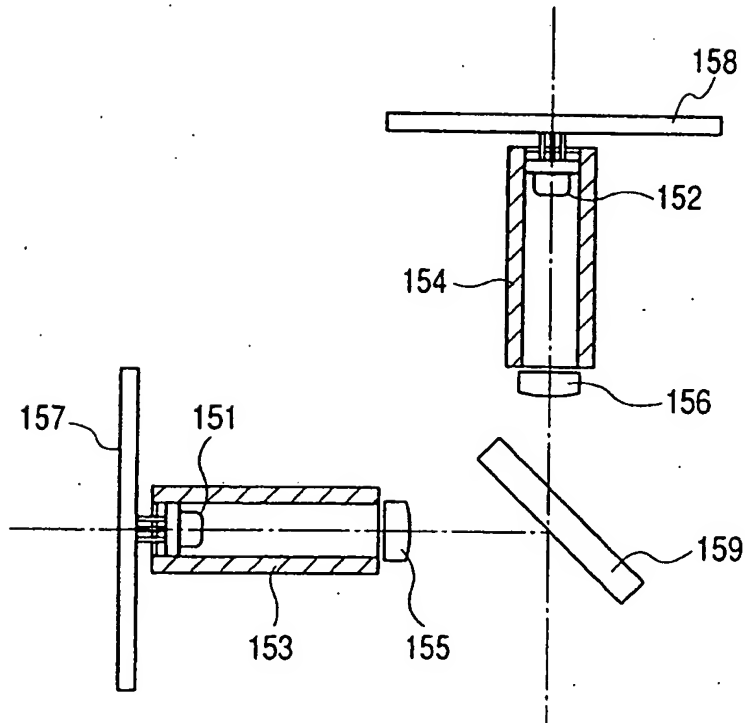


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HCB  
11/16/06

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PRIOR ART

**FIG. 14**



Approved  
HCP  
11/16/06